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TRANSFORMING INTERNATIONAL MARITIME CONTRACTS: THE ROLE OF ELECTRONIC BILL OF LADING

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Abstract

In the evolving landscape of international trade, the Bill of Lading (B/L) remains one of the most vital documents facilitating the legal and logistical movement of goods across borders. Traditionally paper-based, the B/L, alongside the insurance policy and commercial invoice forms the trio of "magic documents" essential for maritime shipping. However, the rise of the Electronic Bill of Lading (eB/L) represents a significant shift toward the digitalization of maritime commerce. This article investigates the transformative impact of the eB/L on international maritime contracts, with the objective of evaluating its effectiveness, legal recognition, and practical implications. Adopting a doctrinal research methodology, the study critically analyzes statutory frameworks, international conventions, and case law, supplemented by a review of industry practices. The findings reveal that while the eB/L enhances efficiency, traceability, and reduces fraud, its widespread adoption faces barriers such as fragmented legal standards, technological interoperability issues, and limited recognition in some jurisdictions. The article concludes by recommending the harmonization of international legal frameworks and investment in secure digital infrastructure to support broader implementation. Ultimately, the study underscores that the eB/L, if properly integrated, can modernize maritime contracts and significantly improve the reliability of global trade.

Keywords: Digital trade documentation, maritime trade, electronic bill of lading, trade efficiency

1. Introduction

Many aspects of our lives such as the way we interact, conduct businesses and manage information have been increasingly affected by technology and electronic means of communication. International Trade and contracts have not been an exception. They have been deeply impacted by the wave of digital innovation. One aspect that has also been affected is the dematerialization of the paper bill of lading which is an important document in international sale and shipping contract. Historically, the bill of lading has been essential to international trade. Acting as a title document, a receipt for delivered goods, and proof of the carriage contract, it guarantees the transfer of control and possession of items being transported. Traditionally, this document has existed solely in paper form, requiring physical handling, endorsement, and delivery**.** With the advancement in maritime technology, we now have faster and more efficient ships in the maritime industry and these ships (with the goods) now gets to the port of destination before the corresponding paper bill of lading gets there and this will cause delay in the discharge of the cargo and increased risks of disputes or lost shipments. Also, with the option to sell the goods during transit, parties are now becoming aware that the paper bill of lading may not be able to meet the demands of speed, security and accessibility required by modern Global Trade.

2. History of Bill of Lading

When there was no bill of lading in the eleventh century, merchants traveled with their goods, and a clerk was expected to enter all of the commodities' information in a single book or register that was a part of the ship's records A law was issued in Ancona in 1397 requiring all clerks to give copies of their registers to anyone who may request them.[1]

As trade evolved, the merchant ceased to accompany their goods, necessitating the creation of a distinct document that initially served as proof that the goods had been received by the carrier but eventually evolved into a contract outlining the terms under which the carrier would transport and deliver the goods

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[1] C Maclughlin, 'The Evolution of the Ocean Bill of Lading' (1926) 35 *The yale Law Journal,* 550

to the port of destination. This agreement binds the carrier and the consignee to the terms of the shipment, and a copy signed by the master was a suitable means to show who had title to the goods. It was with this copy of the ship's document that the "bill of lading" became a negotiable document.[2]

Trade increased within the Mediterranean ports and there was need to have records of the goods shipped, and the most logical way of making this possible was by means of a ship's register which will be put together by the ship's master. Though such register began informally, but started having statutory flavour, around 1350.[3]

By the fourteenth century, an onboard record had taken over the Bill of Lading's receipt function; nevertheless, as the shipper continued to transport the cargo, there was no need for a separate record of the laden items. This was altered, nevertheless, when traders sent products to their correspondent at the port of destination and advised them in letters on the cargo being shipped and how to handle it. They also started requesting for the ship register from the carriers and send some copies of same to their correspondence.[4]

As time went on, B/L became the primary shipping document which served as a proof of the contractual arrangement between the carrier and the shipper taking the form of a non-negotiable bill of lading. The practice of transferring ownership of the items by endorsing the B/L to the buyer emerged as a result of the necessity for a way to transfer title in the commodities before they reached their destination. From there, the BL as a negotiable instrument was created. The BL was in widespread use by the end of the 16th century, and the earliest copy of a bill of lading still in existence was most likely the one from the Thomas case, when a copy was kept in the court file.

3. Features of the Bill of Lading

The bill of lading is the most vital document in international Sale of Goods and plays an important role in financing the transaction and in situations where the goods need to be resold even in transit.[5] A bill of lading is a document between the shipper and the carrier of goods which provides in details the quantity of the goods being carried and where it is being carried to. The bill of lading also serves as a receipt of shipment when the good is delivered to the specified location. This document which must be signed by an authorized representative from the carrier, shipper and receiver must accompany the goods.[6]

The bill must be clean[7] which means that the goods do not have any form of defect at the time of shipment. This feature is crucial for buyers and financiers as a clean B/L assures them the shipment met the required standards at the time of loading. If the bill notes any form of damage or defects, it is called a *claused* or *dirty* bill of lading.

The bill of lading must show that the contract of carriage was proper and usual in the trade. Shipping methods or conditions that are unusual or not customary in the relevant trade could invalidate or affect the bill's effectiveness. In the case of Geofizika *v* MMB[8] the ambulances were shipped on deck which was lost in transit, the court held that shipping of ambulances on deck was not proper and usual in the trade.

The bill of lading must not only be genuine, but must also be valid and effective. as stated in the case of Arnold Kerberg&Co *v Blyth Green*.[9] It must comply with all legal requirements and not be tainted by

[2] O Ogunyemi, 'Introduction of Electronic Bill of Lading in the Carriage of Goods by Sea, the Need for the Ratification of the Rotterdam Rules, 2008' Faculty of Law, University of Oslo, LLM Thesis
[3] Maclughlin (n 1)
[4] Ogunyemi (n 2)
[5] *Hansson v Hamell & Horley* [1922] 2 AC
[6] Ogunyem (n 2)
[7] The Galatia [1980] 1 WLR 495
[8] *Geofizika v MMB* [2010] 2 Lloyd's Rep 1
[9] *Arnhold Karberg & Co V Blythe Green Jourdian & Co* [1916] 1 KB 495

illegality. In that case, the goods were sold CIF (Cost insurance and Freight) Naples and shipped on a German ship, though both seller and buyer were British, the contract of carriage was void for illegality on the outbreak of the war in 1914. The tender of the bill of lading was therefore not valid and effective.[10] It must refer to goods actually shipped,[11] The items that have been physically carried aboard the vessel must be appropriately described and referenced in the B/L. Tendering a B/L that references goods not shipped or shipped incorrectly may be considered defective. It must also be issued on shipment,[12] The BL must be issued at or shortly after the goods have been handed over to the carrier, certifying the receipt of the cargo by the carrier. A bill issued before shipment or for goods not yet loaded is generally invalid. A key feature of the bill of lading is its ability to be transferred to others, especially when it is negotiable (e.g., "to order" BL). This transferability allows ownership and control over goods to change hands during transit.[13] It must be true in what it says.[14] Any false statement can affect the reliability and validity of the document. The B/L must cover the entire voyage and in the case of transshipment, it must cover the transshipment as well. In the case of *Landaeur & Co v Craven*[15], the CIF London hemp sale included shipping to Mania, where it was customary to transship to Hong Kong. The B/L submitted was deemed flawed since it did not include the Mania to Hong Kong leg of the voyage.

4. Functions of the Bill of Lading

a. The bill of lading serves as a receipt of goods shipped. The ship master acknowledges that the consignor's goods have been loaded onto the vessel for delivery to the predetermined location. When the goods have been placed on board, the carrier issues the bill of lading which includes details regarding the amount of goods received, their apparent good order and condition, and quality marks. It is an admission by the ship master that the consignor's goods have been placed on board for transportation to agreed destination[16].

b. The bill of lading serves as a document of title. Until the goods are delivered, holding the bill of lading (B/L) by the endorsee serves as symbolic ownership of the goods, effectively functioning as a document of title. This allows the buyer to transfer ownership of the goods while they are still in transit by endorsing the B/L and passing it on to a third party. The subsequent endorsee then acquires the same rights and can continue this chain of transfer. Upon endorsement, the new holder gains the ability to sue or be sued based on all the terms stated in the B/L[17], even without a direct contractual relationship. Essentially, the bill of lading legally represents the goods, so transferring the B/L is equivalent to transferring ownership of the goods themselves.

c. The Bill of lading as evidence of carriage of goods: When the bill of lading is held by the shipper, it is considered prima facie proof of the contract of carriage, since the contractual terms between buyer and seller are usually agreed upon verbally before the bill is issued. In the case of *Cho Yang Shipping Co Ltd v Coral (UK) Ltd*[18], the Court of Appeal confirmed that under English law, the bill of lading does not itself constitute the contract between the original parties but serves only as evidence of that contract.[19] Consequently, a shipper has the right to raise objections upon receiving the bill of lading if it does not accurately represent the agreed terms.

d. Evidence for Claims

In the event of loss, damage, or delay, the bill of lading provides critical evidence to determine liability. It helps establish whether goods were properly loaded, the condition at the time of shipment, and the contractual obligations of the carrier. As such, it is often used in legal disputes and claims processes.

e. Negotiability

[10] ibid
[11] *Hindley v East India produce* [1973] 2 Lloyd's rep 515
[12] *Hanson v hamel &Horley* [1922] AC 36 the bill of lading issued did not cover the transshipment and the buyer was entitled to reject it.
[13] Indira Carr, *International Trade law* (5th edn (Routeledge 2014)
[14] *Kwei Tek Chao v British Traders* [1954] 2 QB 559
[15] *Landauer &Co v Craven* [1912] 2 KB 94
[16] Carr (n 13)
[17] S. 2 and S.3 of the carriage of goods by Sea Act
[18] *Chao yang Shipping Ltd v Coral* (UK) Ltd 2 Loyd's Rep. 641
[19] Carr (n 13)

Traditional bills of lading are typically negotiable instruments. This means they can be transferred from one person to another person, usually by endorsement and delivery. The negotiability feature enables goods to be traded multiple times while still in transit, which is a key component of international trade finance. The negotiable B/L allows banks to provide letters of credit and financing against the document, supporting global commerce.[20]

5. Legal Framework for Electronic Bill of Lading

The transition from conventional paper bills of lading (BL) to electronic bills of lading (eB/L) presents important legal considerations. The legal framework governing eB/Ls must ensure that these digital documents retain the essential characteristics and enforceability of their paper counterparts, such as being recognized as documents of title, evidence of contracts of carriage, and negotiable instruments. However, because eB/Ls are a relatively recent innovation, international legal regimes and national laws are still evolving to provide clear and consistent rules. The United Nations Convention on International Trade Law (UNICTRAL) has created two laws to govern electronic bill of lading. They are The Rotterdam Rules 2008 (The United Nations Conventions on Contracts for the International Carriage of Goods wholly or partly by sea) and The Model Law on Electronic Transferrable Records (MLTER) 2017

5.1 The Rotterdam Rules 2008

The Rotterdam Rules is an international treaty aimed at updating the legal framework governing maritime transport and the carriage of goods by sea. While these rules include provisions for eB/L, they have not been widely adopted globally. In contrast, the Model Law on Electronic Transferable Records (MLETR) facilitates the lawful use of electronic transferable documents, including bills of lading, bills of exchange, promissory notes, and warehouse receipts.[21]

When UNICITRAL was drafting the convention, there was a mutual understanding that any instrument that had to do with carriage of goods by sea should cover the use of electronic means of communication under the contract of carriage. The Rotterdam Rules is the first International Convention for the international carriage of goods by sea to provide this electronic means of communication. By adding clauses pertaining to the electronic alternative to transport documents, which are found in its third chapter, it updated the scope of maritime transportation. The third chapter stipulates that transport documents and their electronic counterparts are of equal significance.[22]

According to Article 8(a) of the Convention, "consent" is a crucial requirement for using electronic documents as an alternative to paper ones. As a result, if both the shipper and the carrier agree, electronic records will have the functional equivalence of paper documents. "Exclusive control" was another essential component of the Convention for the use of electronic records; this basically determines the holder's status and his right to the delivery of the goods as well as the exercise of other rights.

5.2 The Model Law on Electronic Transferable Records

By offering an open framework, the MLETR seeks to revolutionize the trade financing sector. whereby documents in international trade are digitalize. With MLETR, Shipping companies can digitally share the B/L via email to seller, the seller will then send the B/L to their bank via internet banking. The bank (that is the seller's bank) will then pass the documents to the buyer's bank via Interbank mode of communication called (SWIFT) act. The buyer's bank will subsequently forward the documents to their client (the buyer) through the bank's internet banking system. Finally, the buyer submits the bill of lading to the shipping company either by email or another method—to facilitate the receipt of the goods.

[20] CFI Team 'Negotiable Bill of Lading' < https://corporatefinanceinstitute.com/resources/commercial-lending/negotiable-bill-of-lading/ > accessed 1 May 2025
[21] The Rock and partners, 'The need for electronic Bill of Lading in Nigeria' (2021) <https://www.linkedin.com/pulse/need-electronic-bills-lading-nigeria-therockandpartners#:~:text=An%20eB%2FL%20serves%20the,L%20to%20govern%20their%20transactions > accessed 15 March 2025
[22] Ogunyemi (n 2)

According to Article 7, an electronic transferable record must not be denied legal validity or effect solely because it exists in electronic form.[23]

5.3 National Laws

The acceptance and regulation of eB/L vary significantly by jurisdiction. Some countries have amended their laws to explicitly recognize electronic documents in shipping and trade. The UK has adopted legislation recognizing electronic bills of lading, supported by common law precedents and statutory reforms that validate electronic bill of lading as documents of title.[24] The Legislation cleared the path for greater usage of electronic Bill of lading albeit with the disclaimer that the courts will still have a significant role in determining the full application of this new law.

On the 1st of February, 2020, the Singapore government passed the Electronic Transactions (Amendment) Bill in Parliament (the Bill), amending the Electronic Transactions Act (ETA), Bills of Lading Act and Contracts (Rights of Third Parties) Act. This Singapore's Electronic Transactions Bill and amendments to its carriage of goods legislation have paved the way for the use of eB/Ls, positioning Singapore as a leading jurisdiction embracing digital trade documentation[25]. In the US, the legal framework is more fragmented, with variations between states regarding electronic negotiable documents. However, efforts are ongoing to harmonize regulations, and some states have enacted laws consistent with UNCITRAL's MLETR principles.

However, Nigeria currently lacks specific legislation that directly addresses the use of eB/L The closest legal provision recognizing electronic documents is found in the Evidence Act of 2011. Under Section 84(1) of this Act, electronic documents may be admissible as evidence, provided the conditions outlined in subsection (2) are satisfied. While one might argue that there is a significant difference between a simple computer-generated document and a legally binding eB/L potentially stretching the scope of the Evidence Act. It is reasonable to conclude that, based on the Act's provisions, an electronic bill of lading can be admitted as evidence under Nigerian law.[26]

6. Electronic Bill of Lading: The Need

The society is being transformed through technology and technology is transforming logistics. An eB/L is the legal and functional equivalent of a paper bill of lading. There have been several attempts since the early 80s to develop the eB/L to replace the paper one owing to the shortcomings of the paper one. According to the Cambridge Business Dictionary, an e-B/L is "a B/L that is sent and stored by a computer rather than on paper." Časlav in his article stated as follows:

> The term "electronic bill of lading" refers to more than just a computer-generated document with the same information as a paper bill of lading. An electronic bill of lading means something more: The information entered into a computer is communicated electronically using electronic communications, resulting in an e-Bill that consists of a sequence of electronic messages sent and received between a shipper, carrier, and consignee.[27]

The eB/L developed out of the need to remedy the challenges that arise as a result of the use of Paper based bill of lading. One of the challenges is that due to the fact that ships now move fast, the ship gets to the destination ports earlier than the Bill of lading which is usually transferred through courier services as result, the party entitled to the goods at the port of discharge may not be able to take delivery of the goods if he doesn't have a copy of the bill of lading at hand. This mismatch causes costly delays in cargo release, storage fees, and operational inefficiencies. Electronic Bill of Lading can be transmitted

[23] Article 7 Model Law on Electronic Transferrable Records
[24] Electronic Trade Document Act 2023
[25] UKPandI (2021) 'Singapore Government passes Law to Recognize electronic Bill of Lading' <https://www.ukpandi.com/news-and-resources/news/article/articles/2021/singapore-parliament-passes-law-to-recognise-electronic-bills-of-lading/ > accessed 18 May 2025
[26] E Umoekan <https://www.paulusoro.com/resources/tag/e-bill-of-lading/ > accessed 20 May 2025
[27] C Pejovic 'Documents of title in carriage of goods by sea" under English Law, legal Nature and Possible future direction' Poredbemo Pomorsko Pravo 43 no 153 (2004) 43 -83

instantaneously around the world, ensuring that all relevant parties have timely access to necessary documents, expediting clearance and delivery.

In addition, a paper bill of lading can be falsified and there is a high chance of wrong delivery over a forged bill of lading.[28] It can also lead to illegal transfer of goods and financial losses. Electronic Bill of Lading on the other hand are processed safely and securely so losses or frauds during shipment are usually avoided.

According to Proctor, the greatest challenge to the effective movement of goods from one country to another is the need to physically move from one country to another. There is one thing technology does and that is: It saves time and one major advantage of eB/L is that it will save time, there will be less paper work and a more streamlined work flow for everyone.[29]

The eB/L can be transmitted globally in an instant, significantly reducing the administrative complexities of international trade. This enables seamless transfer of cargo ownership multiple times, even while the goods are still in transit aboard the vessel.[30] Any amendments or corrections can be made quickly and cost-effectively, ensuring greater efficiency in managing the document.

Electronic bill of lading is also of immense benefit to the environment as we are facing serious environmental challenges such as deforestation and climate change. Four billion paper documents are thought to be produced annually by the international trade sector.[31] Handling paper documentation involves printing, courier services, storage, and administrative labor, all of which add to the cost of international shipments. Digitizing the bill of lading reduces these expenses, creating cost savings for carriers, traders, and financial institutions. Therefore, reducing paper consumption is now very necessary.

The eB/L also encourages transparency, the eB/L works as a source of essential information all in electronic format and every individual involved in the transaction have accessed to all the information.[32] It allows real-time tracking and verification of the bill of lading's status and ownership history. This transparency facilitates better supply chain management, compliance with regulations, and faster resolution of disputes.[33]

The COVID-19 pandemic significantly accelerated the push toward digitization across various sectors, including international trade. With restrictions on physical movement and disruptions to traditional processes, businesses and governments were forced to adopt digital solutions to maintain operations. In the context of shipping and trade, the pandemic highlighted the inefficiencies of paper-based documentation, leading to a rapid shift towards electronic systems like the eB/L[34] This change demonstrated the long-term advantages of digital transformation in improving speed, security, and efficiency in international trade in addition to ensuring company continuity throughout the epidemic.

7. Technology Behind Electronic Bill of Lading

The technology behind eBL is designed to replicate and enhance the critical functions of the paper bill of lading while leveraging the benefits of digital innovation. The integration of various technologies is essential to ensuring that eBL provide the same level of security, authenticity, and legal recognition as

[28]Sally- Ann Underhill and William Bibby (2016) 'Electronic Bills of Lading' <https://www.shiplawlog.com/2016/01/14/electronic-bills-of-lading/#more-1137 > accessed 13 May 2025
[29] Proctor C, The legal Role of the bill of lading, sea Waybill and Multimodal Transport Document Vol 1(Integral Pretoria, 1997)
[30] ibid
[31] C Chatfield, 'Electronic Trade Document Act UK , UK modernizes the law surrounding electronic Bill of Lading' <https://kennedyslaw.com/en/thought-leadership/article/2023/the-electronic-trade-documents-act-2023-uk-modernises-the-law-surrounding-electronic-bills-of-lading/> accessed 1 May 2025
[32] Cargofive <https://cargofive.com/8-benefits-of-the-electronic-bill-of-lading/ > accessed 17 May 2025
[33] ibid
[34] MLETR: 'An Overview of Unicitral's Model Law on Electronic Transferable Records' (2024) <https://academy.iccwbo.org/digital-trade/article/mletr-an-overview-of-uncitrals-model-law-on-electronic-transferable-records/ > accessed 12 May 2025

their paper counterparts, if not more. The following are the key technologies driving the adoption and functionality of eBL:

a. **Blockchain Technology**: Blockchain offers a decentralized, unchangeable ledger that records each and every transaction related to the eB/L, from issuance to transfer. This technology ensures that the bill of lading is secure, transparent, and tamper-proof. Blockchain encrypts data and creates a permanent record of all changes made to the eBL, making it virtually impossible to alter or forge.[35] All parties involved in the shipment process (such as the shipper, consignee, carrier, and bank) can view the eB/L in real time, promoting greater transparency and reducing disputes. Because the blockchain is decentralized, no single entity controls the eBL, which reduces the risk of fraud and enhances trust between international parties. Blockchain enables the digital version of the bill of lading to function in the same way as the paper version, with the added benefit of faster, secure transfer and verification of ownership.[36]

b. **Smart contracts**: These contract are self-executing with the terms directly written into code. In the context of eB/Ls, these contracts can automate the execution of various processes, such as the transfer of goods ownership or the release of payments, once certain conditions are met. Smart contracts automate tasks that would otherwise require human intervention, such as verifying that goods have been shipped or paid for, reducing delays and human error. With smart contracts, all parties can trust that once the agreed-upon conditions are satisfied, the contract will execute automatically without the need for intermediaries or further paperwork. This automation not only streamlines the shipping process but also ensures that the terms of the contract are adhered to in a transparent and enforceable manner.[37]

b. **Digital signatures and encryption:** These are critical components of the eB/L system. Digital signatures verify the authenticity of the document and ensure that it hasn't been tampered with, while encryption secures the data against unauthorized access. **Digital signatures offer a safe and enforceable method of authenticating.** Each party signs the eBL with a unique digital signature, which is verified against a public key, ensuring that the document is legitimate and legally valid. **Encryption** on the other hand ensures that the data within the eBL is protected, preventing unauthorized persons from accessing or altering the document. With encryption, only authorized users can access the eBL or modify its contents, adding another layer of security. These technologies ensure that the eBL maintains the same level of integrity and security as a paper-based B/L.[38]

d. **Cloud computing**: Cloud-based platforms are often used to host and manage electronic bills of lading, providing a centralized, scalable, and accessible system for document storage and management. Cloud-based eB/L systems allow stakeholders from around the world to access the bill of lading in real time, improving collaboration and reducing the need for physical document transfer. Cloud services can easily scale to handle large volumes of eBLs, ensuring that the system can grow alongside the needs of international trade. Cloud platforms provide secure and reliable data storage, ensuring that eB/Ls are backed up and protected against loss or damage. Cloud computing enables stakeholders to securely store, manage, and retrieve eBLs from anywhere, significantly improving the flexibility and efficiency of the trade process.[39]

e. Interoperation ability and Standardized Protocols: For eB/L systems to be effective, different digital platforms and systems must be able to communicate with each other. Interoperability and standardization protocols are essential for ensuring that eB/Ls can be transferred between different stakeholders and systems, regardless of their technological background. Several organizations, such as the Digital Container Shipping Association (DCSA), have worked on creating standards for eB/Ls to guarantee that all parties involved in the shipping process are using compatible systems. These standards allow eB/Ls to function across various platforms, such as those used by shipping companies, banks, and customs authorities, enabling seamless integration and communication throughout the trade process. Interoperability and standardization protocols ensure that eB/Ls can be used globally, across different platforms and jurisdictions, fostering widespread adoption.[40]

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[35] P Todd 'Electronic Bill of Lading' BlockChains and Smart Contract' (2020) 27(4) International *Journal of Law and Information Technology* < https://doi.org/10.1093/ijlit/eaaa002 > accessed 13 May 2025
[36] ibid
[37] ibid
[38] Melissa Newland and Timo Vouri 'The Use of Digital Signatures on Electronic Bill of Lading' (2003) First Australian Information Security Management Conference
[39] ibid
[40] ibid

8. Challenges of Electronic Bill of Lading

Although subject to cyber risks and system downtime, the immense benefits of eB/Ls cannot be overemphasized. One of the foremost challenges is the lack of universal legal recognition and harmonization of eB/Ls across jurisdictions. Many countries' legal systems have yet to explicitly recognize electronic documents as equivalent to paper bills of lading, especially concerning their role as negotiable documents of title. Differing laws create uncertainty for parties involved in international trade. Lack of clear legal frameworks can lead to disputes or rejection of eB/Ls by customs, banks, or courts.[41] Another Challenge is the need for Robust security measures. It will be necessary to guarantee the digital document's integrity and security.to prevent modification or access that is not authorized.[42]

Ensuring that everyone engaged in the goods sale can access and utilize the electronic bill of lading efficiently is another difficulty. In addition to training and support for users who might not be as accustomed to new technology, this calls for the creation of common technical standards and protocols.
Conventional bills of lading are negotiable documents that enable the transfer of ownership of goods upon the physical document's endorsement and delivery. Translating this negotiability into a digital format is complex. Ensuring secure, legally binding digital transfers that replicate paper BL endorsements is a challenge. Some jurisdictions do not yet recognize electronic endorsements, limiting eBL functionality. Furthermore, there can be some misunderstanding when negotiating international contracts because not all nations have adopted this technology yet.

Multiple service providers offer eBL platforms, often using different technologies and standards. Lack of interoperability between these platforms poses significant problems. Difficulty in transferring eBLs seamlessly between different platforms or parties. There is also the risk of fragmentation in the digital ecosystem, limiting adoption. There are also Technological barriers. For eB/L to be implemented, it will require reliable, secure digital infrastructure. Stakeholders in the supply chain may lack technological readiness or access. Concerns over cybersecurity threats, hacking, or data breaches can undermine trust in eB/L systems.

Many stakeholders, including carriers, banks, insurers, and shippers, are accustomed to paper-based processes and may be hesitant to adopt new digital solutions. Resistance stems from perceived risks, costs, or lack of understanding of eBL benefits. Traditional practices and contractual frameworks are deeply entrenched, making transition slow.

While eB/Ls can reduce operational costs over time, initial investment in technology, training, and system integration can be high, especially for smaller players in the shipping industry. Some companies may not be comfortable trusting such an important document. Also, there may be technical difficulty such as the system crashing or when there is power outage.[43]

While eBLs represent a major step forward in digitizing international trade documentation, overcoming these legal, technological, and operational challenges is critical to their widespread adoption. In order for eB/Ls to realize their promise of revolutionizing international trade, cooperation between governments, industry stakeholders, and technology providers is necessary to build confidence, legal certainty, and smooth interoperability.

9. Conclusion

The Electronic Bill of Lading (eB/L) represents a pivotal advancement in the evolution of international trade documentation. As global commerce becomes increasingly complex, fast-paced, and digitized, the traditional paper bill of lading reveals its limitations—causing delays, incurring costs, and posing risks of loss or fraud. The eBL addresses these challenges by leveraging innovative technologies such as blockchain, smart contracts, and digital signatures to provide a secure, efficient, and legally recognized alternative.

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[41] The Rock and partners (n 21)
[42]Ocean Side Logistics (2023) 'why could e-bills of lading be troublesome longer term?' < https://oceansidelogistics.com/adoption-of-e-bills-of-lading-challenges-and-solutions/#:~:text=One%20of%20the%20key%20challenges,prevent%20unauthorized%20access%20or%20modification > accessed 20 may 2025
[43] Maersk, 'What are the Challenges associated with Electronic Bill of Lading' <https://www.maersk.com/support/faqs/electronic-bills-of-lading > access 15 May 2025

Throughout this article, we have explored the historical significance and core features of the bill of lading, examined the legal frameworks shaping eB/L adoption, and highlighted the compelling need for digital transformation in trade documentation. We have also delved into the technological foundations of eB/Ls and the challenges that must be overcome for broader acceptance. Case studies and industry initiatives demonstrate that, despite hurdles, the shipping industry is actively moving toward eB/L adoption, driven by the promise of enhanced speed, transparency, security, and cost savings.

Looking ahead, the success of eB/Ls depends on continued legal harmonization, technological interoperability, and collaboration among stakeholders including carriers, shippers, financial institutions, and regulators. Embracing eBLs not only modernizes global trade but also aligns with the broader digital transformation agenda, enabling supply chains to become more resilient, sustainable, and responsive.

10. Recommendations

To fully harness the benefits of the Electronic Bill of Lading (eBL) and accelerate its adoption in international maritime contract, a number of critical steps must be taken by all stakeholders involved. First and foremost, there is a pressing need for harmonization of legal frameworks across jurisdictions. Governments and international bodies should prioritize adopting and aligning laws that explicitly recognize eBLs as valid and negotiable documents. Embracing international standards such as the UNCITRAL Model Law on Electronic Transferable Records (MLETR) and incorporating provisions from conventions like the Rotterdam Rules will provide the legal certainty that traders, carriers, and financial institutions require to trust and rely on electronic documentation.

Equally important is the promotion of interoperability and standardization among the diverse platforms that support eB/L issuance and transfer. Collaboration between technology providers, industry players, and regulatory organizations will help develop common protocols that ensure seamless exchange of electronic bills of lading across different systems. Such efforts will reduce fragmentation in the digital ecosystem and increase user confidence by making eB/Ls universally accessible and transferable.

Investment in technology and infrastructure is another vital aspect. Shipping companies, ports, banks, and other key actors should commit resources to building secure, scalable, and resilient digital systems capable of handling eB/L effectively. Complementing this technological investment, comprehensive training and capacity-building initiatives are essential to equip personnel with the skills necessary to navigate the new digital processes confidently and efficiently.

In addition, fostering strong collaboration and open communication among stakeholders is crucial to overcoming resistance and uncertainty. Encouraging dialogue between carriers, shippers, insurers, financial institutions, and regulators will help identify concerns and streamline adoption. Industry-wide education campaigns are also needed to raise awareness about the advantages of eB/L and dispel misconceptions, thereby facilitating smoother transitions from traditional paper-based methods.

Cybersecurity and data privacy considerations must be prioritized to safeguard sensitive information handled through eB/L platforms. By putting strong security measures in place and abiding by pertinent data protection laws, such as the GDPR, will maintain trust among users and minimize dangers related to unauthorized access or data breaches.

Supporting pilot projects and sharing successful case studies can further accelerate adoption by demonstrating practical benefits and providing actionable insights. Real-world examples help stakeholders understand the value proposition of eBL and offer blueprints for overcoming implementation challenges.

Finally, engaging judicial and regulatory bodies to formally recognize electronic bills of lading will help build legal precedents and reduce uncertainties around their enforceability. Clear guidance from courts and regulators will encourage banks and commercial parties to accept eBLs confidently, paving the way for broader use across international trade.

By addressing these key areas through coordinated legal reform, technological advancement, and stakeholder engagement, the shipping and trade industries can unlock the full potential of electronic bills of lading ushering in a new era of efficiency, security, and innovation in global commerce.